

SOV124-57-5-5178

On the Stability of Approximately-determined Periodic Modes (cont.)

13, pp 151-160). Approximate equations of the disturbed motion are derived by the harmonic-equilibrium method. On the basis of an analysis of these equations the author derives the approximate conditions of stability of forced oscillations, comparing them with the conditions adduced by L. S. Gol'dfarb (loc. cit.) and A. I. Lur'ye [Nekotoryye nelineynyye zadachi teorii avtomaticheskogo regulirovaniya (Some Nonlinear Problems of Automatic-control Theory). Moscow-Leningrad, Gostekhizdat, 1951, p 216] indicated for cases of self-sustained oscillation. The author stresses the point that the indications adduced in the text determine the stability only under certain specific assumptions, e.g., for systems, differing little from linear ones, which are derived for the border of the stability region by means of a pair of purely imaginary roots.

N. N. Krasovskiy

Card 2/2

*Smirnova, I. M.*  
USSR/Mathematics - Regulation theory

FD-1674

Card 1/1

Pub. 10-10/11

Author : Smirnova, I. M.  
Title : Chronicles. Seminar on the mathematical problems of the theory of automatic regulation  
Periodical : Avtom. i telem., Vol. 16, 111, Jan-Feb 1955  
Abstract : After a year's interruption operations have been renewed by the seminar organized by the Institute of Mathematics imeni V. A. Steklov and by the Institute of Automatics and Telemechanics, which is devoted to the mathematical problems arising in connection with the development of automatic regulation theory. In the first session (22 Sep 1954), engineer B. L. Korobochkin (Machine Factory imeni Ordzhonikidze) reported on problems on hydraulic servosystems of copying machines. In the second (20 Oct), Prof. Ye. P. Popov (Leningrad), doctor of technical sciences, read the first part of his report on harmonic balance applied to approximate studies of self-excited oscillations in nonlinear automatic regulation systems (cf. DAN SSSR, Vol. 95, No 5, 1954; Izvestiya AN SSSR, OTN, No 5, 1954). The third (3 Nov) was devoted to the report of Yu. I. Neymark (Gor'kiy University) on the subject "Periodic motions of relay systems of automatic regulation." In the fourth session (17 Nov), Prof. Ye. P. Popov read the second part.  
Institution : --  
Submitted : --

*Smirnova, I. M.*  
USSR/Electricity - Regulation

FD-1675

Card 1/1      Pub. 10-11/11

Author      : Smirnova, I. M.

Title      : Letter to the editor

Periodical      : Avtom. i telem., Vol. 16, 112, Jan-Feb 1955

Abstract      : In her article "Approximate investigation into the conditions for stability of periodic regimes in automatic regulation systems," published in No 2 for 1945, same periodical, an error was noted by E. M. Sonechnyy in the formula for the coefficient  $b_{2n-1}$  (page 106), which led to an incorrect construction of the limit of positiveness of this coefficient for the case  $K(jw)$  not constant. The correct expressions for the coefficients  $b_i$  are given in the present note.

Institution      : --

Submitted      : --

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SOV/103-21-2-8/14

AUTHORS: Ayzerman, M. A., Gusev, L. A., Rozonoer, L. I.,  
Smirnova, I. M., Tal', A. A.

TITLE: Finite Automatons. I

PERIODICAL: Avtomatika i telemekhanika, 1960, Vol 22, Nr 2, pp  
224-236 (USSR)

ABSTRACT: The authors give their point of view on the theory of finite automata. A finite automaton is defined as a dynamical system which at certain discrete moments satisfies the following conditions: (1) The state of the system is selected from a finite number  $k$  of possible states (2) The state of the input to the system is selected from a finite number  $r$  of possible input states. (3) The state of the system at any considered moment is defined singularly by the state of the system and the state of the input at the preceding moment. The following designations are introduced:  
(a)  $1', 2', \dots, k'$  are symbols of  $k$  possible systems

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or states. Their totality  $\{\gamma\}$  is called a state alphabet; (b)  $P_1, P_2, \dots, P_k$  are symbols of the  $k$  possible input states. Their totality  $\{P\}$  is called an input alphabet. According to the condition (3) the operation of a finite automaton is described by the expression

$$\gamma(p) = F[\alpha(p-1), p(p-1)], \quad (1)$$

where  $F$  is a function with a single value. The abstraction introduced by the concept of "finite automaton" singles out a class of systems in which the processes are described not by differential equations but by specific equations of type (1). A finite automaton may have  $l$  ( $l \leq k$ ) possible output states designated as  $\lambda_1, \lambda_2, \dots, \lambda_l$  or, in their totality designated as an output alphabet  $\{\lambda\}$ . In case of an automaton with an output,

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Eq. (1) must be supplemented by the "momentary" relationship given as

$$z(p) = \Phi[z(p)]. \quad (2)$$

Equations (1) may be represented by Table 1.

Table 1

|       |  | $z_1$ | $z_2$ | $z_3$ |
|-------|--|-------|-------|-------|
| $p_1$ |  | $z_3$ | $z_1$ | $z_2$ |
| $p_2$ |  | $z_1$ | $z_3$ | $z_2$ |
| $p_3$ |  | $z_2$ | $z_1$ | $z_3$ |
| $p_4$ |  | $z_3$ | $z_2$ | $z_1$ |

This table is called the basic table of finite automaton and may be set up in the following manner: a pair of symbols selected from alphabets  $\{P\}$  and  $\{G\}$  determines one case in the table. Assuming the symbol pair as

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$\rho_{(p-1)}$  and  $\nu_{(p-1)}$ , and using Eq. (1), the value of  $\nu_p$  may be determined and written for the above case. Equation (2) also defines a table

TABLE 2

| $x$       | $x_1$       | $x_2$       | $x_3$       | $x_4$       | $x_5$       | $x_6$       |
|-----------|-------------|-------------|-------------|-------------|-------------|-------------|
| $\lambda$ | $\lambda_1$ | $\lambda_2$ | $\lambda_3$ | $\lambda_4$ | $\lambda_5$ | $\lambda_6$ |

For a selected sequence of input symbols  $\rho$ , Table 3

TABLE 3

| $\rho$ | $\rho_1$ | $\rho_2$ | $\rho_3$ | $\rho_4$ | $\rho_5$ | $\rho_6$ | $\rho_7$ | $\rho_8$ | $\rho_9$ | $\rho_{10}$ | $\rho_{11}$ | $\rho_{12}$ |
|--------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------------|-------------|-------------|
| $x$    | $x_1$    | $x_2$    | $x_3$    | $x_4$    | $x_5$    | $x_6$    | $x_7$    | $x_8$    | $x_9$    | $x_{10}$    | $x_{11}$    | $x_{12}$    |

characterizes a sequence of symbols  $\nu$ , in accordance with Eq. (1). In this band there is a corresponding

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$\rho$  and  $\kappa$  for each moment  $t$ . The band is called a state band. Three symbols,  $\kappa(p-1)$ ,  $\rho(p-1)$ , and  $\kappa(p)$ , defined by Eq. (1) are separated by a heavy line on Table 3. They are called a triad. When the system is defined by Eq. (1) and Eq. (2), then an output band, as represented by Table 4, must also be considered.

TABLE 4

| $t$      | 1          | 2          | 3          | 4          | 5          | ... |
|----------|------------|------------|------------|------------|------------|-----|
| $p$      | $p_1$      | $p_2$      | $p_3$      | $p_4$      | $p_5$      | ... |
| $\kappa$ | $\kappa_1$ | $\kappa_2$ | $\kappa_3$ | $\kappa_4$ | $\kappa_5$ | ... |

When the input state does not vary with time the automaton is called autonomic. Equation (1) for this case has the form

$$\kappa(p) = F[\kappa(p-1), \rho(0)], \quad (3)$$

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where  $\rho(0)$  may be considered a parameter. The operation of an autonomic automaton may be represented graphically by  $k$  points corresponding to system states and represented by arrows which show the direction of transition from one point to the other, in accordance with Eq. (3). Since a nonautonomic automaton has  $r$  input states, it can be represented by  $r$  various autonomic automata, under the assumption that the  $r$  input states do not vary. The totality of  $r$  graphs representing the above autonomic automata characterizes the non-autonomic automaton. Figure 1 shows an example of a totality of 3 graphs

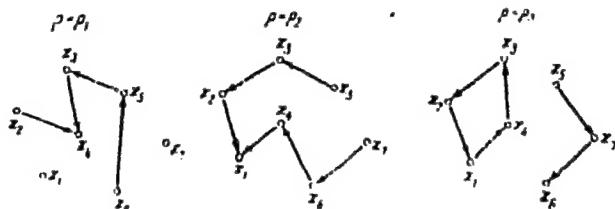


Fig. 1.

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Table 3 corresponds to the automaton characterized by Fig. 1.

TABLE 3

|       | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ | $x_7$ |
|-------|-------|-------|-------|-------|-------|-------|-------|
| $p_1$ | $x_1$ | $x_4$ | $x_4$ | $x_1$ | $x_3$ | $x_5$ | $x_7$ |
| $p_2$ | $x_1$ | $x_1$ | $x_2$ | $x_1$ | $x_3$ | $x_4$ | $x_8$ |
| $p_3$ | $x_6$ | $x_1$ | $x_2$ | $x_3$ | $x_7$ | $x_6$ | $x_8$ |

The introduction of the concept of "finite automaton" poses a series of problems. The bands represented by Tables 3 and 4 are assumed to be infinite and cannot be selected. Selected are the algorithms which determine the symbol for any case of an infinite band. For the band represented by Table 3, the algorithms corresponding to the upper ( $p$ ) and to the lower ( $\chi$ ) line are designated as  $A_p$  and  $A_\chi$ , respectively.

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Similarly,  $A_p$  and  $A_\lambda$  are the algorithms of the output band, represented by Table 4. For a given automaton, the analysis, i.e., the determination of  $A_p$  or  $A_\lambda$  in accordance with  $A_p$ , does not represent any scientific problem. On the contrary, the synthesis of an automaton, i.e., finding the Eq. (1) from the given band algorithms poses several problems. When  $A_p$  and  $A_\lambda$  are known, the first problem consists in finding an algorithm proving that  $A_p$  and  $A_\lambda$  are not contradictory, i.e., there are no contradictory triads in the band. Two triads are contradictory when their symbols  $p(p-1)$  and  $\lambda(p-1)$  are the same, but when symbols  $\lambda(p)$  are different. When  $A_p$  and  $A_\lambda$  are not contradictory, an algorithm must be found determining all various triads of the band. Synthesis corresponding to the output band is a more complex problem. Here  $A_p$  and  $A_\lambda$  are known and the number of states  $k$  and function

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$\Phi$  in Eq. (2) have to be determined. It is stated that in case of finite state and output bands, the synthesis problem becomes less complex. To discuss the synthesis problem the following concepts are introduced:

- (1) The Symbol Converter. This is an abstract arrangement performing the transformation defined by Eq. (2), (2)
- The Equivalent Automaton. On Fig. 2, an automaton

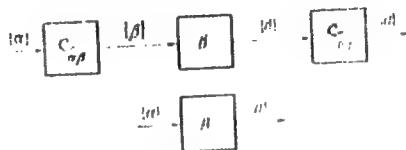


Fig. 2.

A is operating according to the input alphabet  $\{a\}$  and the state alphabet  $\{a\}$ . Automaton B has the input alphabet  $\{B\}$  and the state alphabet  $\{b\}$ . It is assumed that two symbol converters  $c_{aB}$  and  $c_{ba}$  may be selected

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in such a manner that for any sequence of input symbols from  $\{a\}$ , the sequence of symbols from the alphabet  $\{a\}$ , at the output of the combined system  $C$ ,  $B$ ,  $\alpha\beta$ , will be the same as the sequence of state symbols  $C_{ba}$ , in  $A$ . In this case it is said that  $B$  is an image of  $A$  and may be written as.

$A \beta B \Leftrightarrow B \alpha A$ .

When at the same time,

$A \beta B$  and  $A \alpha B$ ,

then  $A$  and  $B$  are equivalent automata. (3) The Abstract Structure of a Finite Automaton. An arrangement of  $s$  input lines  $u_1, \dots, u_s$  and of  $n$ , generalized coordinates  $x_1, \dots, x_n$  is considered. At moments  $0, 1, 2, 3, \dots, p$ , each input and each coordinate has

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only one of a finite number of values. The operation of such an arrangement is described by

$$x_i(p) = f_i[x_1(p-1), \dots, x_n(p-1); u_1(p-1), \dots, u_s(p-1)] \quad (i = 1, \dots, n) \quad (6)$$

Equation (6) is another form of Eq. (1). To one equation of type (1) correspond various equations of the type (6). The transition from Eq. (1) to the equivalent Eqs. (6) is called a selection of structure of a finite automaton, and Eq. (6) themselves are called an abstract structure (AS) of a finite automaton.

(4) The Net. This is a totality of AS, interconnected by means of symbol converters. Based on the above concepts, the authors arrive at the conclusion that a finite automaton may be designed by combining into a net other finite automatons. The design of a multitude of automatons from a small number of initial automaton "elements" is called abstract aggregation. A set of AS and converters is called complete, when by means of this set the networks designed are images of any selected

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automaton. A technically very important complete set is set-up of the following elements: (a) a binary delay element, described by the equation  $x(p) = z(p-1)$ , where  $x$  and  $z$  are selected from an alphabet comprising only two symbols, 0 and 1, for example; (b) a set of logic elements enabling performance of any logical function. It is shown that from the above set a net may be designed to be an image of any finite automaton. (To be continued). There are 4 figures; 6 tables; and 25 references 17 Soviet, 1 French, 7 U.S. The 5 most recent U.S. references are: Burks, A. W., Wright, J. B., Theory of Logical Nets, Proc. IRE, No. 4 (1953); Huffman, D. A., The Synthesis of Sequential Switching Circuits, Journ. Franklin Inst., Vol 257, Nr 3, 4 (1954); Burks, A. W., Wang, H., The Logic of Automata, Journ. Assoc. Comp. Mach., Vol 4, Nr 2, 3 (1957); Davis, M. D., Computability and Unsolvability, McGraw Hill, New York (1957); Copi, I. M., Elgot, C., Wright, J. B., Realisation of Events by Logical Nets, Journ. Assoc., Comp. Mach., 5, p 181, Nr 2 (1958).

SUBMITTED:

June 10, 1959

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78165  
SOV/103-11-3-11/21

AUTHORS: Ayzerman, M. A., Gusev, L. A., Rosonoer, L. I.,  
Smirnova, I. M., Tal', A. A. (Moscow)

TITLE: Finite Automatons. II.

PERIODICAL: Avtomatika i telemekhanika, 1960, Vol 21, Nr 3, pp 359-368 (USSR)

ABSTRACT: The paper is a continuation of the article published in "Avtomatika i telemekhanika," Vol 21, Nr 2. In Part II of this article the following problem is discussed: an automaton  $A'$ , operating at a selected pace of time,  $T'$  is to be formed out of automaton  $A$ , operating at a different pace of time  $T$ . In referring to Part I of the paper, it is shown that this may be obtained by two methods. According to the first method,  $\mathcal{L}$  delay elements, operating at pace  $T$ , are connected in series as shown in Fig. 1,

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forming a delay line described by equations

$$x_1(p) = x_2(p-1),$$

$$x_2(p) = x_3(p-1),$$

$$\dots$$

$$x_t(p) = u(p-1).$$

The number  $\ell$  is a positive integer. It is assumed that pace  $T$  is represented on the time axis by equal intervals  $\tau$  and pace  $T'$  by equal intervals  $\ell\tau$ .

When an automaton is designed by the aggregation method in such a manner that the delay element with pace  $T$  is everywhere replaced by the above described lines, then the resulting automaton still operates at pace  $T$ . However, by registering the input and the delay line output symbols of this automaton after only  $\ell\tau$  sec,

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the automaton with the desired pace may be obtained. The second method is applied to an automaton A, which at the moment  $t_0$  assumes an input state  $\rho_0$ , the latter remaining constant until  $t_1$ . During time  $t_0 \leq t \leq t_1$  the automaton operates as an autonomic automaton (see part I). At  $t = t_1$  the input state  $\rho_0$  changes to  $\rho_1$  and remains constant until  $t = t_2$ , thus defining a new autonomic automaton. At  $t = t_2$  the state  $\rho_1$  changes to  $\rho_2$ , etc. Under the assumption that the input state  $\rho$  and the states  $K(t)$  (see part I) are registered only at times  $t_0, t_1, t_2, \dots, t_i, \dots$ , an automaton A' is obtained and is based on the equilibrium states of autonomic automata. The pace T' of A' is defined by  $t_0, t_2, \dots$ , etc., and does not depend on the pace of the automaton A. It is shown that the above two methods may be applied to neurons and to

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relay-contact systems. By neuron is meant an element with a finite number of inputs and one output only. The input and output states are designated by symbols from the "alphabet"  $\{0,1\}$ . The output symbol is singularly determined by the input symbols which existed  $\tau$  seconds ago. A neuron may be considered as a finite automaton with only two possible states. Neurons may be combined into networks without the use of symbol converters (see Part I). Relay systems may also be considered as finite automatons of the "neuron network" type, the time delay of  $\tau$  sec being determined by the duration of the relay operation. Concluding remarks are made on the possibility of considering a system designed as to belong to the class of finite automatons. The application of the theory of finite automatons is terminated as soon as equations of type (6), Part I, are written. These equations are then used as a basis for engineering design. There are 5 figures; and 1 table.

SUBMITTED: November 26, 1959

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| AYZONOV:  | AYZONOV:  |
| SELETOVY: | SELETOVY: |
|           |           |

**TITLE:** Methods of Working out a Plant's Associate. The first page of which is dependent upon the variation of the plant's price.

The "finite" machine<sup>1</sup> comprises the notion of the infinite automaton on the other hand there is a theorem which shows that a definite machine is no more efficient than a finite machine with an infinite converter. Hence every automaton which can be reduced to a finite automaton is equivalent to a finite automaton. Every automaton can be reduced to a finite automaton with an output converter in such a way that any state of  $M$ , a corresponding state of a finite automaton in this case, is the output sequence of  $M$  on an input of  $p$  if  $p$  represents the output sequence of  $M$  by a delay of  $n$  units of time, in reverse order. This paper deals with sequential machines only, in reality, the finite automaton, formula (6), is obtained from (3) and (4) by eliminating  $p$  and  $p'$ . It reads  $A(p) = P([A(p)], [p])$ , the working cycle of  $A$ ,  $[A(p)]$ , is clearly determined by the moments at which the input states is changed. It is assumed that the same table of the (6) automaton is given. Three methods of realizing this machine by means of sequential automata are studied. The methods differ in the amount of information required for the solution of the problem. The first method is due to B. H. Hoffmann (ref. 5). The second method provides for the form of

additional information on the instant at which the input state had changed. In the third method, the datacenter obtains the information that the input state at the respective instant and performs prediction based on it to obtain the most accurate estimation. In this case it is possible not only to predict reasonably accurately the future states of the system, but also to reduce as much as possible.

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APPROVED FOR RELEASE: 08/24/2000

**CIA-RDP86-00513R001651620012-7"**

AYZERNAN, M.A. (Moskva); GUSEV, L.A. (Moskva); ROZONOER, L.I. (Moskva)  
SMIRNOVA, I.N. (Moskva); TAL', A.A. (Moskva)

Algorithmic insolvability of a problem on the recognition of the  
representability of recursive events in finite automata.  
Avtom. i telem. 22 no.6:748-755 Je '61. (MIRA 14:7)  
(Automatic control)

AYZERMAN, M. A. (Moskva); GUSEV, L. A. (Moskva); ROZONOER, L. I. (Moskva);  
SMIRNOVA, I. M. (Moskva); TAL', A. A. (Moskva)

Conversion of the time pace of sequential machines and synthesis  
of switching circuits. Avtom. i telem. 23 no.11:1465-1491  
N '62. (MIRA 15:10)

(Electric relays) (Switching theory)  
(Automatic control)

AYZERMAN, Mark Aronovich; GUSEV, Leonid Alekseyevich; ROZONOER,  
Lev Il'ich; SMIRNOVA, Irina Mikhaylovna; TAL', Aleksey  
Alekseyevich; KOROLEV, N.A., red.; MURASHOVA, N.Ya.  
tekhn. red.

[Logic. Automats. Algorithms] Logika. Avtomaty. Algoritmy.  
(MIRA 17:3)  
Moskva, Fizmatgiz, 1963. 556 p.

ACCESSION NR: AP4042259

S/0089/64/017/001/0045/0049

AUTHORS: Sty\*rikovich, M. A.; Marty\*nova, O. I.; Katkovskaya, K. Ya.; Dobrovskiy, I. Ya.; Smirnova, I. N.

TITLE: Transition of iodine from aqueous solutions into saturated steam

SOURCE: Atomnaya energiya, v. 17, no. 1, 1964, 45-49

TOPIC TAGS: reactor fuel rod, reactor coolant, reactor inspection, reactor safety, iodine, radioactivation analysis

ABSTRACT: In view of the importance of monitoring the tightness of the cladding of rod and plate type fuel elements in water-water and boiling-water reactors, the authors consider the quantitative distribution of elementary iodine (used as a detector of the tightness of the cladding) and its hydrolysis product between boiling water and dry vapor in equilibrium with it at pressures 1.9, 4, and 10

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ACCESSION NR: AP4042259

kg/cm<sup>2</sup> at pH values from 5.5 to 11. The investigation was made by a bubbling method which is briefly described together with the apparatus employed. The results show that the fraction of the hydrolysis product at low concentrations ( $<10^{-5}$ -- $10^{-5}$  mole/liter) is practically equal to unity. At increased temperatures and increased steam density, HIO is produced and the coefficient of distribution of this acid between the boiling water and the steam is a power function of the ratio of the steam to liquid density. It is concluded that in evaporating equipment where the iodine concentration can exceed  $10^{-4}$  mole per liter, the pH at room temperature must be kept in the interval 9.5--10 in order to prevent the iodine from being carried away from the water into the steam. When I<sup>131</sup> is used as a monitor for fuel cladding element in boiling water reactors at pressures of 30 kg/cm<sup>2</sup> and above, the samples must be so taken as not to dilute them with steam, since the iodine content in the water exceeds that in the steam. Orig. art. has: 5 figures.

Card 2/6

ACCESSION NR: AP4042259

ASSOCIATION: None

ENCL: 03

SUBMITTED: 22Jul63

OTHER: 002

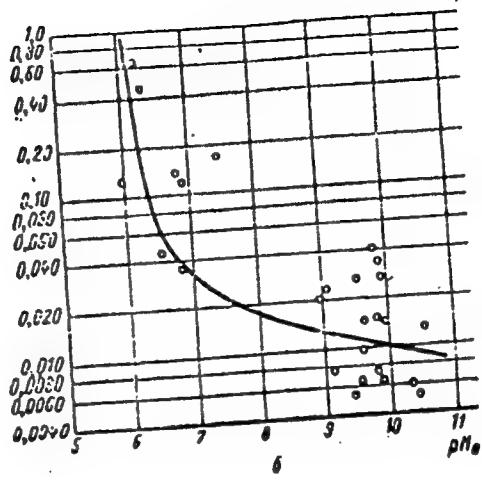
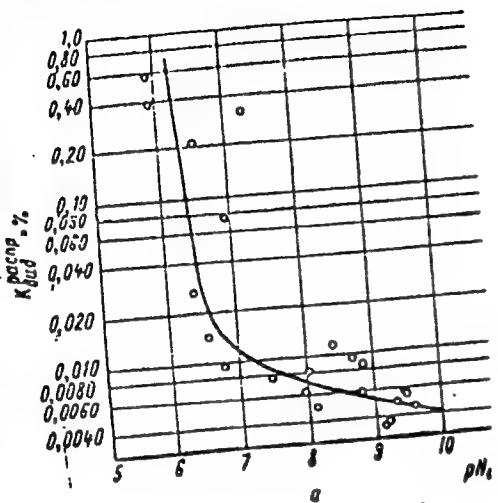
SUB CODE: NP

NR REF SOV: 005

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ENCLOSURE: 01

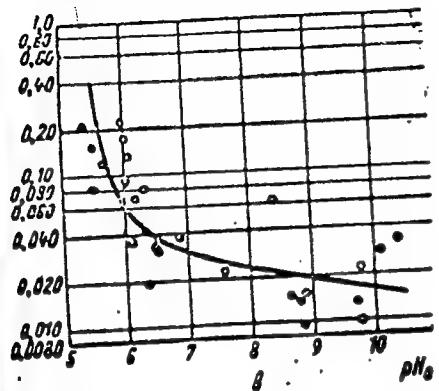
ACCESSION NR: AP4042259



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ENCLOSURE: 02

ACCESSION NR: AP4042259



Dependence of iodine distribution coefficient on the pH at different pressures

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SMIRNOV, I. N.

USSR.

Structural (phase) transformations in iron-graphite com-  
pacts on sintering. V. I. Likhman and I. N. Smirnova.  
*Doklady Akad. Nauk S.S.R.* 86, 1161-3 (1952).—In order  
to study the mechanism of transformations more convenient-  
ly than it is possible with the use of ferritic malleabilized  
Fe, a mixt. of graphite and Fe powder was compressed and  
then sintered at 1000 and 1100°. The lower temp. was  
selected here as a min. required for an efficient sintering,  
which in the 1st case was conducted under a vacuum of 10<sup>-3</sup>  
mm. of Hg and in the 2nd in N. Austenite formation is  
caused by a contact diffusion of C, first following grain  
boundaries and then penetrating into the grains. C concn.  
is higher near graphite inclusions. The process is  
rapid. Heating for 1 hour at 1000° resulted in a ferrite-pearl-  
ite matrix corresponding to about 0.4% C equil. Addnl.  
heat-treating causes the usual transformations responding  
to the C-Fe equil., but the graphitization of fully cementitic  
alloy is faster than usual because of the presence of voids.  
J. D. Gut

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Inst. Phys. Chem., AS USSR

SMIRNOVA, IV.

✓ Individuality of the compound  $\text{NH}_4\text{BeF}_4$ . Yu. P. Smirnov, I. N. Smirnova, and A. V. Novoselova (State Univ., Moscow); *Zhur. fiz. Khim.* 29, 287-90 (1955); cf. Thilo and Schröder, *C.A.* 45, 10024d. The crystal structures of  $\text{NH}_4\text{BeF}_4$  and  $(\text{NH}_4)_2\text{BeF}_4$  were detd. by x-ray diffraction. The resp. lattice parameters are:  $a = 5.777$ ,  $b = 4.610$ , and  $c = 12.55$  kX, rhombic; and  $a = 5.860$ ,  $b = 7.61$ , and  $c = 10.45$  kX, rhombic. There are 4 mols. in the unit cell for both. The ds. are 1.005 and 1.685 g./cc., resp. Reflection angles measured on oscillation photographs are tabulated. They are not in accord with those reported by Thilo and Schröder. J. W. Loweberg, Jr.

3

4  
0  
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8634-65 ENT(m)/EPR/ENP(q)/ENP(b) Ps-4 ASD(m)-3/AS(mp)-2 JD  
S/0078/64/009/008/1883/1897 B

ACCESSION NR: AP4043575

AUTHOR: Bol'shakov, K. A.; Fedorov, P. I.; Smarina, Ye. I.; Smirnova, I. N.

TITLE: The Al-Mg-Ga system

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 8, 1964, 1883-1897

TOPIC TAGS: aluminum magnesium gallium system, ternary alloy, alloy phase diagram, alloy phase structure

ABSTRACT: Alloys of the Al-Mg-Ga system in the as-cast, quenched, and annealed conditions were investigated by thermal analysis and x-ray diffraction pattern examination. The compositions of investigated alloys melted from 99.6 or 99.9% pure Al, 99.9% pure Mg, and 99.97% pure Ga were along the sections parallel to the Al-Mg side of the concentration triangle and had a constant Ga content of 5, 10, 15, 20, 25, 30, and 35 wt%. In addition, Al-Mg<sub>5</sub>Ga<sub>2</sub>, Mg<sub>5</sub>Ga<sub>2</sub>—36% Mg, 66% Al sections, and a section with a constant 25 wt% Mg content were investigated. On the basis of the obtained results, phase diagrams of the Al-Mg-Ga system and investigated sections, and the isotherms at

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L 8834-65

ACCESSION NR: AP4043575

300 and 20C were plotted (see Fig. 1 of the Enclosure). In the Al-Mg-Ga phase diagram a ternary intermetallic phase, Z, which forms an extensive region of solid solutions and can be regarded as a bertholite-type phase, was identified. The structure of the Z phase is highly similar to the structure of the B phase obtained under conditions of incomplete annealing of the Al-Mg system. At the temperature of the liquids' surface, the Al-Mg-Ga diagram is characterized by the absence of strictly binary sections and by the presence of quasi-binary sections. In solid condition, however, two-phase regions are clearly distinguishable between adjacent single-phase regions. Orig. art. has: 13 figures and 1 table.

ASSOCIATION: none

SUBMITTED 29May63

ATD PRESS: 3106

ENCL: 01

SUB CODE: MM

NO REF Sov: 005

OTHER: 009

Card 2/3

L 8834-65

ACCESSION NR: AP4043575

ENCLOSURE 10

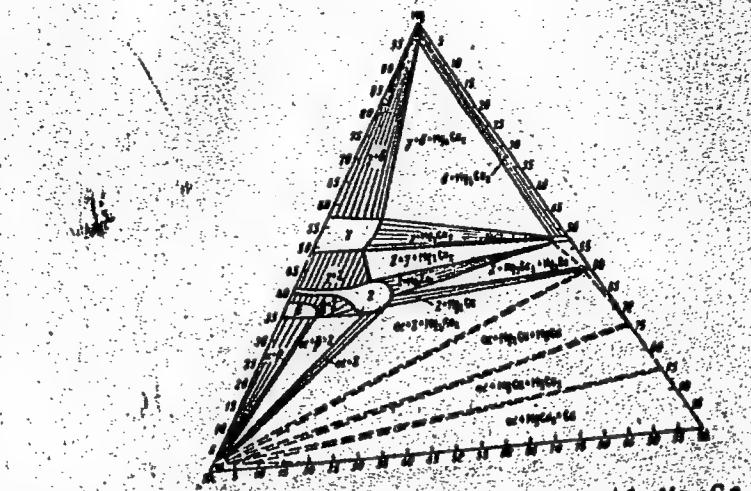


Fig. 1. Phase distribution in the Al-Mg-Ga system at  
200°C

Card 3/3

SMIRNOVA, I.N.; KOLYAGIN, A.P.

Diagram of states in the systems  $N_{2}O_4 + CrCl_3$  and  $N_{2}O_4 + BeCl_2$ .  
Izv. Ak. SSSR. Neorg. mat. 1 no.7(13)2-1165 31 1965. (MIRA 18:9)

I. N. Smirnovsky Institute of theory khimicheskoy tekhnologii imeni N.Y.  
Lobachevskogo.

SMIRNOVA, I. N.

sov/81-59-15-537/6

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 15, p 267 (USSR)

AUTHORS: Smirnova, I.N., Bulezin, S.A.

TITLE: The Method of Investigating the Inhibitors of Corrosion of Cylinders in Internal Combustion Engines

PERIODICAL: V sb.: Etudy issled. inhibitorov korrozii metallov (Vses. sov. nauchno-tehn. o-v. Nr 7). Moscow, 1958, pp 126 - 135

ABSTRACT: Laboratory tests make it possible to establish the effect of the S content in the fuel and of special admixtures on the aggressiveness of combustion products of fuel and on the corrosion rate of metals. At stand tests the effect of admixtures on the wear of piston rings of the engine GAZ-M-20 activated on Fe by the irradiation method was studied. The intensity of the wear was controlled by the activity of the gear box oil, into which pass the wear products of the piston rings. Besides that, the relative quantity of S was determined which was eliminated from the engine by waste gases as well as the pH and the content of  $SO_4^{2-}$  in the condensate of these gases; for

Card 1/2

C

SMIRNOVA, I.N.; BALEZIN, S.A.

Effect of organic additions in fuel on the corrosion and wear  
of automobile engines. Uch. zap. MGPI no.146:102-126 '60.  
(MIRA 15:4)  
(Engines—Corrosion) (Addition reactions)

S/081/61/000/009/007/015  
B101/B205

AUTHORS: Smirnova, I. N., Balezin, S. A., Golovanov, K. N.

TITLE: Effect of organic admixtures to motor fuel on corrosion and wear of internal-combustion engines. (Stand tests of anticorrosive admixtures to motor fuel)

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 9, 1961, 275, abstract 9M233 (9I233) ("Uch. zap."] Mosk. gos. ped. in-ta im. V. I. Lenina", 1960, no. 146, 127 - 146)

TEXT: It was found that addition of anticorrosive admixtures to motor fuel leads to intensified removal of corrosive sulfur from the motor. Reduction of the amount of aggressive agent decreases the corrosion of surfaces in the motor. Anticorrosive admixtures inhibit the oxidation of  $SO_2$  to  $SO_3$  but promote the formation of a protective layer on the operating surfaces of the motor. [Abstracter's note: Complete translation.]

Card 1/1

18.1210

2408

30177

S/078/61/006/012/003/011

B110/B147

AUTHORS:

Bol'shakov, K. A., Fedorov, P. I., Smarina, Ye. I.,  
Smirnova, I. N.

TITLE:

Study of the common solubility of magnesium and gallium in  
aluminum

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 12, 1961, 2727-2731

TEXT: The authors studied the ternary system aluminum - magnesium - gallium, and examined the common solubility of magnesium and gallium in aluminum at 290, 240, and 20°C. The alloys were molten from 99.6 and 99.9% Al, 99.91% Mg, and 99.97% Ga with a flux consisting of 46% of  $MgCl_2$ , 35% of  $KCl$ , 8% of  $CaCl_2 + NaCl$ , and 11% of  $BaCl_2$ . For 14 days to 3 months, the samples were annealed in evacuated glass ampuls and tempered in water. The common solubility was determined by microstructural analysis (etching agent: 2.5%  $HNO_3$ ; 2.0%  $NaOH$ ) and by determination of hardness according to Vicker (diamond pyramid, load: 10 kg). When the equilibrium limit of

Card 1/4 2

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B110/B147

Study of the common solubility of ...

homogeneity is reached, separations in the second phase increase, whereas the content of incidental impurities in phase transition remains unchanged. Microstructural studies showed the following phase regions : (1) that of the homogeneous aluminum-base solid solution:  $\alpha_{\text{Al}}$ ; (2) two-phase regions.

$\alpha + \beta$ ,  $\alpha + z$ ,  $\alpha + \text{Mg}_2\text{Ga}$ ,  $\alpha + \text{MgGa}_2$ ,  $\alpha + \text{Ga}$ ; (3) three-phase regions:

$\alpha + \beta + z$ ;  $\alpha + z + \text{Mg}_2\text{Ga}$ ;  $\alpha + \text{Mg}_2\text{Ga} + \text{MgGa}$ . The solid aluminum-base solution was found by alkaline etching, the  $\beta$ -phase (slightly yellow) and  $z$ -phase (black) were found by weak  $\text{HNO}_3$  (2.5%),  $\text{Mg}_2\text{Ga}$  and  $\text{MgGa}$  phases were

found by alkaline etching. Transitions from homogeneous into binary and ternary and from binary into ternary regions were characterized by salient points in the composition - hardness curves. This is in good agreement with data obtained by microstructural analysis. In the region of low Ga additions ( $\leq 1\%$  by weight), the common solubility of Mg and Ga first increases at all temperatures, and then slightly drops again. It increases rapidly when the Al - Ga side is approached. There are 8 figures and 10 references: 1 Soviet and 9 non-Soviet. The two references to English-language publications read as follows: M. Hansen, Constitution of binary alloys, 1958, 105; I. Clare, J. Inst. Metals, 86, 43: (1958)

Card 2/12

X

L 41063-65 EWT(m)/EWP(b)/EWP(t) IJP(c) JD  
ACCESSION NR: AR5005873

S/0081/64/000/023/V138/V138

14

B

SOURCE: Ref. zh. Khimiya, Abs. 23V13

AUTHOR: Chernykh, V. Ya.; Talanov, N. D.; Smirnova, I. N.

TITLE: Synthesis of high-purity phosphorus trichloride

CITED SOURCE: Tr. po khimii i khim. tekhnol. Gor'kiy, vyp. 2(8), 1963, 220-224

TOPIC TAGS: phosphorus trichloride, phosphorus purity, chlorine purity

TRANSLATION: A method was developed for preparing high-purity  $PCl_3$  by synthesis from elemental P and  $Cl_2$  with a content of total measurable impurities of  $1.2 \times 10^{-4}\%$  and below. A laboratory apparatus was developed which permits the synthesis of  $PCl_3$  and its distillation to be carried out simultaneously under conditions of high experimental purity. Experiments showed that the principal role in the synthesis of high-purity  $PCl_3$  is played by the quality of the starting products. The usual subsequent double distillation of the  $PCl_3$  is ineffective in improving the quality of the preparation. Authors' summary

ENCL: 00

SUB CODE: IC

Card 1/1 CC

SMIRNOV, I.II.

Specific lesions of the pharyngeal tonsil in lymphogramulomatosis.  
(MIR 7:1)  
Vest.oto-rin.15 no.6:75-76 N-D '53.

1. Iz kafedry bolezney ukha, gorla i nosa (zaveduyushchiy -  
professor N.a.Karpov) Leningradskogo meditsinskogo stomatolo-  
gicheskogo instituta. (Tonsils) (Hodgkin's disease)

SMIRNOVA, I.N.

Malignant degeneration of retropharyngeal chordoma. Vest.oto-rin.  
16 no.1:79-81 Ja-F '54. (MIRA 7:3)

1. Iz kafedry bolezney ukha, goria i nosa (zaveduyushchiy - pro-  
fessor N.A.Karpov) Leningradskogo meditsinskogo stomatologicheskogo  
instituta. (Pharynx--Tumors)

SMIRNOVA, I.N., kandidat meditsinskikh nauk (Leningrad, Botkinskaya ul.,  
94<sup>th</sup> (Novostroyka) knav. 92)

Errors in the diagnosis and therapy of malignant tumors of the  
respiratory tract. Vop.onk. 1 no.3;31-36 '55. (MLRA 10:1)

1. Iz Instituta onkologii AMN SSSR (direktor - chlen-korrespondent  
AMN prof. A.I.Serebrov) i kliniki oto-rino-laringologii stomatolog-  
cheskogo fakul'teta Leningradskogo sanitarno-gigiyenicheskogo medi-  
tsinskogo instituta (zaveduyushchiy kafedroy - prof. N.A.Karpov)  
(RESPIRATORY TRACT, neoplasms,  
diag. & ther. errors)

BABCHIN, I.S., prof.; BABANOVA, A.G., doktor med. nauk; BLOKHIN, N.N., prof.; BONDARCHUK, A.V., prof.; GAL'PERIN, M.D., prof.; GOL'DSHTEYN, L.M., prof. [deceased]; DYMARSKIY, L.Yu., kand. med. nauk; KARPOV, N.A., prof.; KOYRO, M.A., nauchn. sotr.; LARIONOV, L.F., prof.; LITVINNOVA, Ye.V., kand. med. nauk; MEL'NIKOV, R.A., kand. med. nauk; NECHAYEVA, I.D., doktor med. nauk; PETROV, Nikolay Nikolayevich, prof.; PETROV, Yu.V., kand. med. nauk; RAKOV, A.I., prof.; ROGOVENKO, S.S., kand. med. nauk; SENDUL'SKIY, I.Ya., prof.; SEREBROV, A.I., prof.; SMIRNOVA, I.N., kand. med. nauk; TAL'MAN, I.M., prof.; TOBILLEVICH, V.P., prof.; TRUKHALEV, A.I., kand. med. nauk; KHOLDIN, Semen Abramovich, prof.; CHEKHKARINA, Ye.A., kand. med. nauk; CHECHULIN, A.S., kand. med. nauk; SHAAK, V.A., prof. [deceased]; SHANIN, A.P., prof.; SHAPIRO, I.N., prof. [deceased]; SHEMYAKINA, T.V., kand. med. nauk; SHERMAN, S.I., prof.; ABRAKOV, L.V., red.; LEBEDEVA, Z.V., tekhn. red.

[Malignant tumors] Zlokachestvennye opukholi; klinicheskoe rukovodstvo. Leningrad, Medgiz. Vol.3. Pts.1-2. 1962. (MIRA 16:5)

1. Deystvitel'nyy chlen Akademii meditsinskikh nauk SSSR (for Blokhin, Petrov, Serebrov). 2. Chlen-korrespondent Akademii meditsinskikh nauk SSSR (for Kholdin).

(CANCER)

SMIRNOVA, I.N.

Problems of chemotherapy in cancer cases discussed at the  
Second All-Union Oncological Conference. Sov.med. 22 no.8:148-150  
Ag '58 (MIRA 11:10)  
(CANCER)

KHODYAKOV, N.D., prez., doktor meditsinskikh nauk; SMIRNOVA, I.N., kand.med. nauk; ZABUTIY, M.B.

Second Interrepublic Scientific Conference of Otorhinolaryngologists of the Soviet Baltic States. Vestn. otorinolaring. 25 no.3:117-121 '63  
(MIRA 17:1)

SMIRNOVA, I.N. (Leningrad, K-156, prospekt Engel'sa, 28, kv.113);  
DVORAKOVSKAYA, I.V. (Leningrad, ul. Rentgena, 23, kv.13)

Meningiomatous tumor of the vagus nerve. Vop. onk. 10 no.1:102-103  
164. (MIRA 17:11)

1. Iz otorinolaringologicheskogo otdeleniya (zav. - prof. N.A. Karpov) Instituta onkologii AMN SSSR (dir. - deyствител'nyy chlen AMN SSSR prof. A.I. Serebrov) i patologoanatomiceskoy laboratorii (nauchnyy rukovoditel' - prof. D.I. Golovin) Leninskoy gorodskoy onkologicheskoy bol'nitsy (glavnyy vrach - Ye.M. Nikol'skaya).

SALYAMON, L.Z., kand. med. nauk; SMIRNOVA, I.N., kand. med. nauk

Report on the conference dealing with indirect treatment of  
the tumorous process. Vop. onk. 10 no.12:102-104 '64.  
(MIRA 18:6)

YAKOVIEVA, H.P.; CHEKHARINA, Ye.A.; SMIRNOVA, I.N.

Detection of tumoral cells in the blood in cancer of the organs  
of the respiratory system. Vop. onk. 11 no.2:11-16 '65.

(MIRA 18:7)

1. Iz 2-go khirurgicheskogo otdeleniya (zav. - chlen-korrespondent  
AMN SSSR prof. A.I. Rakov), otolaringologicheskogo otdeleniya  
(zav. prof. N.A. Karpov), klinicheskoy laboratorii (zav. - dotsent  
I.F. Grekh) Instituta onkologii AMN SSSR (direktor - deystvitel'nyy  
chlen AMN SSSR prof. A.I. Serebrov).

L 1555-66 EPA(s)-2/EWT(m)/T/EWP(t)/EWP(b)/EWA(e) IJP(c) JD/JG  
ACCESSION NR: AP5022269 UR/0363/65/001/007/1162/1165  
541.12.012

16  
25  
23  
AUTHOR: Smirnova, I. N.; Kislyakov, I. P.

TITLE: Phase diagrams of the systems  $Na_2W_0_4$  -  $SrW_0_4$  and  $Na_2W_0_4$  -  $BaW_0_4$

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 7, 1965,  
1162-1165

TOPIC TAGS: tungstate, sodium compound, strontium compound, barium compound

ABSTRACT: The study of the phase diagrams involved the use of thermography with simple and differential recording on a KVT-3 electronic recording potentiometer, the microvisual-polythermal method, and x-ray phase analysis. The phase diagram of the  $Na_2W_0_4$ - $SrW_0_4$  system is of eutectic type; the composition of the eutectic is 3 mole %  $SrW_0_4$ , and its melting point is 680-685°C. Sodium tungstate has 2 polymorphic transformations, at 575 and 592°C, both of which appear on the cooling curves. The  $Na_2W_0_4$ - $BaW_0_4$  system is analogous to the previous one. The composition of the eutectic is 4 mole %  $BaW_0_4$ , and its melting point is 680-683°C. The temperatures of the phase transformations are tabulated and the phase diagrams are given for both systems. Orig. art. has: 2 figures and 2 tables.

Card 1/2

L 1555-66

ACCESSION NR: AP5022269

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M. V. Lomonosova (Moscow Institute of Fine Chemical Technology)

SUBMITTED: 23Mar65

ENCL: 00

SUB CODE: IC, SS

NO REF Sov: 000

OTHER: 002

Card

2/2 50

L1000001 FWFC/2/EWT/2, LIPCo, RN

ACC NR: AP6027734

(A)

SOURCE CODE: UR/0020/66/169/004/0832/0834

AUTHOR: Babitskiy, B. D.; Grechanovskiy, V. A.; Poddubnyy, I. Ya.; Smirnova, I. N.; Dolgoplosk, B. A.

ORG: none

35  
BTITLE: Some regularities in the change of the molecular weight distribution of *cis*-1,4 polybutadienes obtained under the influence of Ziegler-Natta catalysts

SOURCE: AN SSSR. Doklady, v. 169, no. 4, 1966, 832-834

TOPIC TAGS: polybutadiene, catalytic polymerization, molecular weight, titanium compound, organoaluminum compound

ABSTRACT: The complex Ziegler-Natta catalyst  $TiI_4 + Al(iso-C_4H_9)_3$  was used to synthesize *cis*-1,4-polybutadienes. The effect of the degree of conversion of the monomer, concentration of the catalyst  $TiI_4 + Al(iso-C_4H_9)_3$ , and polymerization temperature on the molecular weight and molecular weight distribution (MWD) of the polymers formed was studied. The MWD was determined from sedimentation rates in a "Phywe" centrifuge. Samples obtained at various stages of polymerization at 25°C showed that independently of the degree of conversion of the monomer, beginning with the smallest experimentally measurable degree of conversion (~15%), the MWD of the polymers does not change, i. e., the process is a steady one. The catalyst and monomer concentrations do not affect the steadiness of the process. The latter is affected, however, by a

Card 1/2

UDC: 66.095.265+678.744

L 05129-67

ACC NR: AP602773<sup>4</sup>

drop in the polymerization temperature to 15°C, and in this case the molecular weight increases with the degree of conversion. The molecular weight of cis-1,4-polybutadienes increases with the initial concentration of the monomer and with decreasing initial concentration of the catalyst. As the temperature drops, the nature of the change in molecular weight as a function of these two concentrations remains the same. It is concluded that the polymerization of butadiene over  $TiI_4 + Al(iso-C_4H_9)_3$  at 15°C and below involves the "live"-chain mechanism, whereas at higher temperatures an increasingly important role is played by chain-limiting reactions. Orig. art. has: 4 figures.

SUB CODE: 07/ SUBM DATE: 13Jan66/ ORIG REF: 004/ OTH REF: 004

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Card 2/2

L 42178-66 EWT(m)/T/EWP(t)/ETI IJP(c) W/JD/JG/GD  
ACC NR: AT6022480 (A) SOURCE CODE: UR/0000/65/000/000/0116/0120

AUTHOR: Kislyakov, I. P.; Smirnova, I. N.; Buynov, B. I.; Khomutova, T. V.; Tokunov, T. V.

ORG: Moscow Institute of Fine Chemical Technology im. M. V. Lomonosov (Moskovskiy B11 Institut tonkoy khimicheskoy tekhnologii)

TITLE: Synthesis and solubility of barium, calcium, and manganese tungstates in melts of certain salts

SOURCE: Vsesoyuznoye soveshchaniye po fizicheskoy khimii rasplavlenykh soley. 2d, Kiev, 1963. Fizicheskaya khimiya rasplavlenykh soley (Physical chemistry of fused salts); trudy soveshchaniya. Moscow, Izd-vo Metallurgiya, 1965, 116-120.

TOPIC TAGS: tungstate, barium compound, calcium compound, manganese compound, solubility, chemical precipitation, aqueous solution, temperature dependence, recrystallization

ABSTRACT: Manganese tungstate was prepared by precipitation from aqueous solutions of  $MnCl_2$  and  $Na_2WO_4$ , and  $MnWO_4 \cdot 2H_2O$  was obtained. A study of the solubility of dehydrated  $MnWO_4$  in  $Na_2WO_4$  and  $Na_2WO_4 + 20\% NaCl$  melts showed it to be strongly temperature-dependent. Three different types of  $MnWO_4$  crystals corresponding to three different regions of crystallization were obtained. Manganese tungstate was also prepared in the melt via the reaction  $Na_2WO_4 + MnCl_2 \rightarrow 2NaCl + MnWO_4$ , and the product did not differ from that prepared by recrystallization. Barium tungstate was obtained by

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L 42178-66

ACC NR: AT6022480

precipitation from dilute aqueous solutions of  $\text{BaCl}_2$  and  $\text{Na}_2\text{WQ}_4$ . A microvisual-poly-thermal method was used in studying the solubility in the  $\text{BaCl}_2\text{-BaWQ}_4$  system at high temperatures. Coarsely crystalline  $\text{BaWQ}_4$  was prepared by recrystallizing dehydrated  $\text{BaWQ}_4$  in molten  $\text{BaCl}_2$  and also by the reaction  $\text{BaCO}_3 + \text{WO}_3 \rightarrow \text{BaWQ}_4 + \text{CO}_2$  in the same medium. Calcium tungstate was obtained in similar fashion. Its solubility in  $\text{CaCl}_2$  at high temperatures was determined. Attempts to crystallize  $\text{CaWQ}_4$  from  $\text{CaCl}_2$  melt showed this method to be inappropriate in air (the  $\text{CaWQ}_4$  crystals contained excess  $\text{CaO}$ ). Orig. art. has: 4 figures and 1 table.

SUB-CODE: 07/ SUBM DATE: 23Aug65/ ORIG REF: 003/ OTH REF: 002

ms  
Card 2/2

PISTYAKOV, I. I.; SMIRNOVA, I. N.

Phase diagram in the system barium chloride-barium tungstate.  
Zhur. neorg. khim. 9 no.12:2788-2789 D 1964.  
(MIRA 18:2)  
I. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni  
Lomonosova.

SMIRNOV, L. A.

Luteinization of follicular cysts in rat ovaries resulting from the action of potassium iodide. Biul. ekspr.-biol. i med. 57 no.5. 94- (MIRA 18:2) 98 May '64.

I. Laboratoriya eksperimental'noy gormonoterapii (zav. - kand. biologicheskikh nauk N. I. Lazarev) Instituta eksperimental'noy i klinicheskoy onkologii (dir. - deyствител'nyy chlen AMN SSSR prof. N. N. Blokhin) AMN SSSR, Moskva. Submitted May 11, 1963.

SMIRNOVA, I.O.; SAMOYICOV, V.I.

Effect of extract taken from a mammary gland tumor on the  
folliculo-stimulating function of the hypophysis in rats.  
Biul. eksp. biol. i med. 59 no.4:92-94 Ap '65.

(MIRA 18:5)

1. Laboratoriya eksperimental'noy gormoterapii (zav. - kand.  
biologicheskikh nauk N.I. Lazarev) Instituta eksperimental'noy  
i klinicheskoy onkologii (dir. - deystvitel'nyy chlen AMN SSSR  
prof. N.N. Blokhin) AMN SSSR, Moskva.

SMIRNOVA, I.P.

Using a set of punched cards with master cards intended for punched card computers in the "Ural-2" electronic digital computer. Trudy AANII 271:70-73 '64.

(MIRA 18:2)

MIKHAYLOVA, Lyudmila Alekseyevna; TARASOV, Konstantin Georgiyevich;  
DLIN, Nikolay Aleksandrovich; SMIRNOVA, I.P., red.; ANDREYEVA,  
K.A., red.kart; MAKHOVA, N.N., tekhn.red.

[Readings in physical geography (Western Europe); a manual for  
teachers] Khrestomatiia po fizicheskoi geografii (Zapadnaia  
Evropa); posobie dlia uchitelei. Moskva, Gos.uchebno-pedagog.  
izd-vo M-va prosv. RSFSR, 1959. 344 p. (MIRA 12:4)  
(Europe, Western--Physical geography)

ABRAMOVICH, Genrikh Naumovich. Prinimali uchastiye: YAKOVLEVSKIY, O.V.;  
AVDUEVSKIY, V.S.; SHIRNOVA, I.P.; CHERKEZ, A.Ya. APPEL'BAUM,  
S.O., red.; TUMARKINA, N.A., tekhn.red.

[Theory of turbulent jets] Teoriia turbulentnykh strui. Moskva,  
Gos.izd-vo fiziko-matem.lit-ry, 1960. 715 p. (MIRA 13:10)  
(Turbulence) (Jets)

DOLGIN, I.M., kand.geograf.nauk; NIKOLAYEVA, T.V., mladshiy nauchnyy sotrudnik; BISOVA, L.G., mladshiy nauchnyy sotrudnik; VORONTSOVA, L.I., mladshiy nauchnyy sotrudnik; DANIOVA, V.M., mladshiy nauchnyy sotrudnik; KOVROVA, A.M., mladshiy nauchnyy sotrudnik; SERGEYEVA, G.G., mladshiy nauchnyy sotrudnik; SMIRNOVA, V.N., mladshiy nauchnyy sotrudnik; KHARITONOV, L.I., mladshiy nauchnyy sotrudnik; ALEKSANDROV, V.F., aerolog; KUZNETSOV, O.M., aerolog; MAYOROVA, L.A., aerolog; POSTNIKOVA, D.G., aerolog; SMIRNOVA, I.P., aerolog; VASIL'YEVA, R.P., tekhnik; MEDNIS, L.V., tekhnik; KHARITONOV, V.A., tekhnik; KHRUSTALEVA, N.K., red.; DROZHZHINA, L.P., tekhn.red

[Aerological observations of Arctic stations during the period from June 30 through December 31, 1957] Aerologicheskie nabliudeniia poliarnykh stantsii s 30 iyunia po 31 dekabria 1957 g. Leningrad, Izd-vo "Morskoi transport," 1961. 994 p. (Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut Trudy, vol.243) (MIRA 14:11)

(Arctic regions—Meteorology—Observations)

ACC NR: AT6036184

SOURCE CODE: UR/3116/66/277/000/0058/0062

AUTHOR: Smirnova, I. P.

ORG: none

TITLE: Principles of processing computer punchcard information on a Ural-2 computer

SOURCE: Leningrad. Arkticheskiy i antarkticheskiy nauchno-issledovatel'skiy institut. Trudy, v. 277, 1966, Chislennyye metody issledovaniya gidrometeorologicheskikh usloviy v Arktike s ispol'zovaniyem elektronnykh tsifrovych vychislitel'nykh mashin (Numerical methods of studying hydrometeorological conditions in the Arctic with the use of electronic digital computers), 58-62

TOPIC TAGS: PUNCHED CARD, HYDROMETEOROLOGY, ARCTIC CLIMATE, computer application, aerology, isobaric surface, computer, INFORMATION PROCESSING / URAL 2 COMPUTER

ABSTRACT: On the basis of the principle of information input to a Ural-2 computer from a punchcard tabulator (Tr. Arkt. i antarkt. nauch.-issled. in-ta, t. 271. M.-L., izd-vo "Transport," 1964), an attempt was made to compute, by stations, the required aerological characteristics for isobaric surfaces. The project involved determining the mean aerological characteristics, by quadrangles, from all the drifting stations in the central region of the Arctic Basin for the years for which observation data were available. About 100,000 RZ-2 type punch cards were used with the information on each punchcard related to three standard levels. The problem of direct input to the computer from punchcards without preliminary reproduction was solved by using a VU-700 card reader having a rate of 700 cards/min. The program

UDC: none

Card 1/2

ACC NR: AT6036184

used in this study is discussed, and the process algorithm and a block diagram of the program is given. The input and processing of data for one monthly level takes from 5 to 15 minutes, depending on the number of stations (1 to 8) in a given quadrangle. Orig. art. has: 7 formulas and 1 figure. [WA-N04]

SUB CODE: 04, 09/ SUBM DATE: none/ ORIG REF: 002/

Card 2/2

L 36331-65 EMT(1)/FCC CW  
ACCESSION NR: AT5005822

S/3116/64/271/000/0070/0073

20

19

B+1

AUTHOR: Smirnova, I. P.

TITLE: Use of accumulations of punch cards formatted for analytical calculators in the Ural-2 electronic computer

SOURCE: Leningrad. Arkticheskiy i Antarkticheskiy nauchno-issledovatel'skiy institut. Trudy, v. 271, 1964. Chislennyye metody issledovaniya gidrometeorologicheskikh usloviy v Arktike s ispol'zovaniyem elektronnykh tsifrovyykh vychislitel'nykh mashin; sbornik statey (Numerical methods of investigating hydrometeorological conditions in the Arctic using electronic digital computers; collection of articles), no. 1, 70-73

TOPIC TAGS: punch card, calculator, electronic digital computer, card tape transfer, Arctic meteorology, perforated tape, upper atmosphere

ABSTRACT: It was desired to use punch cards formatted for accounting machines on the Ural-2 computer by transferring data for the upper atmosphere of the central Arctic onto perforated tape. Details of the various formats used on the cards are given for both the accounting machine and the computer. Since the information is punched by columns for the former but by lines for the latter, the

Card 1/2

L 36334-65  
ACCESSION NR: AT5005822

data is first transferred into the permissible columns and then put into the computer memory. A schematic diagram for this operation is given, as well as for analyzing the original experimental data to obtain more detailed information on temperature, pressure, wind velocity than could be obtained conveniently using low-speed accounting machines. Orig. art. has: 1 figure.

ASSOCIATION: Arkticheskiy i Antarkticheskiy nauchno-issledovatel'skiy institut, Leningrad (Arctic and Antarctic Scientific Research Institute).

SUBMITTED: 00

ENCL: 00

SUB CODE: DP, ES

NO REF Sov: 000

OTHER: 001

Card 2/2 *bs*

SOURCE CODE: UR/0124/66/000/002/B055/B055

ACC NR: AR6019260

AUTHOR: Abramovich, G. N.; Smirnova, I. P.

TITLE: Flow distribution with a non-symmetric velocity profile

SOURCE: Ref. zh. Mekhan, Abs. 2B382

REF SOURCE: Sb. Teoriya i raschet ventilyats. struy. L., 1965, 68-80

TOPIC TAGS: nozzle flow, incompressible fluid, approximation method

TRANSLATION: An approximation method is set forth for the calculation of turbulent current flow of an incompressible liquid through two plane nozzles. It is assumed that such a flow is isobaric and that turbulent friction is zero at points of maximum velocity. In solving the problem, the equations of flow quantity for separate parts of the flow are used; the distribution of velocity from each side of a non-symmetric profile of velocity is assumed to be universal; and the laws for the growth of the thickness of each of the two alternating zones are defined by the relation of the transverse pulsation velocity and the mean longitudinal velocity. As a result, a system of four equations is obtained for determining the four unknowns (the velocities and the three characteristic ordinates near the nozzle sections, two velocities--maximum and minimum--and two ordinates distant from the nozzles). The solution of this system agrees satisfactorily with the data given for the experiment; the authors indicate that agree-

Card 1/2

ACC NR: AR6019260

ment may be improved by the choice of an experimental constant different from that used for symmetrical flooded flows. A. S. Ginevskiy.

SUB CODE: 20

Card 2/2

GLEMBOTSKIY, V.A.; SMIRNOVA, I.S.

Flotation methods of ore dressing are one hundred years old. TSvet.  
met 33 no. 12:11-14 D '60. (MIRA 13:12)  
(Flotation)

SMIRNOVA, I.S., kand.tekhn.nauk; BAKHIREV, N.F., inzh.; KACHUROVA, K.P.,  
zootekhnik; KUTSENKO, V.V., inzh.; BEKHTIN, B.I., inzh.; SVEN-  
TETSKIY, I.I., inzh.; KISHECHNIKOV, S.A., inzh.; YEVREINOV, M.G.,  
red.

[Ultraviolet irradiation of farm animals and poultry; a manual]  
Ul'trafioletovoe obluchenie sel'skokhoziaistvennykh zhivotnykh  
i ptits; rukovodstvo. Moskva, Otdel tekhn.informatsii VIESKha,  
1959. 34 p.

(MIRA 13:6)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut  
elektrifikatsii sel'skogo khozyaystva. 2. Deystvitel'nyy chlen  
Vsesoyuznoy akademii sel'skokhozyaystvennykh nauk imeni V.I.  
Lenina (VASKHNIL) (for Yevreinov).  
(Ultraviolet rays--Therapeutic use) (Veterinary hygiene)

SMIRNOVA, I.S., kand.tekhn.nauk; SVENTITSKIY, I.I.; KUTSENKO, V.V.

Using combined radiation equipment in poultry raising. Dokl.  
Akad.sel'khoz. 24 no.9:39-43 '59. (MIRA 13:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut elektrifikatsii  
sel'skogo khozyaystva. Predstavlena akademikom M.G.Yevreinovym.  
(Radiation--Physiological effect)  
(Poultry houses and equipment)

BELYAYEV, L.M.; MARBUTT, K.I.; STOLYAROVA, Ye.L.; KONSTANTINOV, I.Ye.;  
ALEKSEYEV, V.A.; GIL'VARG, A.B.; SMIRNOVA, I.S.

Using luminescent counters for recording X-ray spectra. Izv. AN  
SSSR. Ser. fiz. 20 no.7:801-808 Jl '56. (MLRA 9:11)

1. Institut kristallografi Akademii nauk SSSR, Institut geologii  
cheskikh nauk Akademii nauk SSSR i Moskovskiy inzhenerno-fizi-  
cheskiy institut.  
(X-ray spectroscopy)

AUTHOR: Narbutt, K.I., Smirnova, I.S. 48-10-6/20

TITLE: On the Influence Exercised by the Activator on the X-Ray Absorption Spectrum of a Luminescence Crystal (O vliyanii aktivatora na rentgenovskiy spektr pogloshcheniya lyuminestsentnogo kristalla)

PERIODICAL: Izvestiya Akad.Nauk SSSR, Ser.Fiz., 1957, Vol. 21, Nr 10, pp 1367-1374 (USSR)

ABSTRACT: The following is stated by the present paper: 1.) The influence exercised by the activator on the X-ray absorption spectrum of a luminescence crystal is determined on the basis of the examples of NaJ and CsJ crystals activated by thallium. 2.) On the long wave side of the absorption discontinuity in L<sub>III</sub> spectra of iodine and cesium absorption in the CsJ(Tl) crystal the occurrence of additional absorption maxima, the position of which corresponds to the transitions of electrons in the local levels, was discovered. 3.) On the strength of the analysis of the longwave branch of the L<sub>III</sub> spectrum of the iodine absorption in NaJ(Tl) crystal the values of length of wave bands in the optical domain were computed. These values agree with those wavelengths of the absorption bands found experimentally in optics, especially with the wavelength of the F-band of the NaJ(Tl) crystal. 4.) The changes on the shortwave side of the absorption discontinuity in L<sub>III</sub> spectra of iodine and cesium

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48-10-6/20

On the Influence Exercised by the Activator on the X-Ray Absorption Spectrum of  
a Luminescence Crystal

absorption in NaJ- and CsJ crystals, which are observed when the activator is introduced, consist in the splitting up of the second intense absorption maximum, which, in accordance with the analysis carried out here, points in the direction of the splitting up of the 6s band, at least into two bands. 5.) When the activator is introduced the halide absorption edge is shifted in the direction of the longwave side, and that of the metal towards the shortwave side by an order of about 1 ev. 6.) On the strength of the X-ray spectrum data obtained here the energetical schemes for NaJ(Tl) and CsJ(Tl) crystals are set up. There are 6 figures and 12 references, 10 of which are Slavic.

ASSOCIATION: IGEM, AS USSR (IGEM Akademii nauk SSSR)

AVAILABLE: Library of Congress

Card 2/2

AUTHOR:

Smirnova, I.S., Narbutt, K.I.

48-10-7/20

TITLE:

The Investigation of the Fine Structure of Absorption-X-Ray Spectra of Halide-Alkaline Compounds (Issledovaniye tonkoy struktury rentgenovskikh spektrov pogloshcheniya shchelochno-galicidnykh soyedineniy)

PERIODICAL:

Izvestiya Akad.Nauk SSSR, Ser.Fiz., 1957, Vol. 21, Nr 10,  
pp. 1375-1380 (USSR)

ABSTRACT:

On the strength of the investigations carried out here the following may be said: 1.) The L<sub>III</sub> edges of the absorption of cesium halides and the L<sub>III</sub> edges of the absorption of iodine in all alkali iodides was investigated. 2.) An analysis of the structure of the L<sub>III</sub> edge of cesium and of the L<sub>III</sub> edge of iodine in the CsJ crystal was carried out on the basis of the assumption that the L<sub>III</sub> spectrum is a result of the superposition of four series of lines of selective absorption and of continuous absorption. 3.) The L<sub>III</sub> spectra of cesium in the cesium halides are characterized by an intense first absorption maximum and a weak second maximum. With the L<sub>III</sub> spectra of iodine in the iodide group it is the other way round. 4.) The variation of the structure of the L<sub>III</sub> spectra of cesium- and iodine absorption in transition from one

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48-10-7/20

The Investigation of the Fine Structure of Absorption-X-Ray Spectra of Halide-Alkaline Compounds

compound to another is essentially due to the change of intensity and form of the second maximum of absorption, of which it is assumed that they are connected with the  $2p \rightarrow ns$  transitions.

5.) The wavelength of the first maximum remains unchanged in the L<sub>III</sub> spectra of cesium for all halides. The wavelength of the first maximum in the L<sub>III</sub> SPECTRA OF IODINE VARIES in the domain 0,65 XE (1,4 eV). It is concluded that the energetic position of the lines of selective absorption does not depend on the chemical bond. The latter influences only the intensity ratio of the lines of the basic- and the satellite series, which leads to the observed shifting of the maximum, which is a sum of the basic- and satellite series. There are 1 table, 2 figures and 13 references, 9 of which are Slavic.

ASSOCIATION: IGEM AS USSR (IGEM Akademii nauk SSSR)

AVAILABLE: Library of Congress

Card 2/2

SOV/48-23-5-5/31

24(7)  
AUTHORS: Narbutt, K. I., Smirnova, I. S.  
TITLE: On the Influence of Weak Impurities and Roentgenization on the  
X-ray Absorption Spectrum of the KCl Crystal (O vliyani i malykh  
primesey i rentgenizatsii na rentgenovskiy spektr pogloshcheniya  
kristalla KCl)  
PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959,  
Vol 23, Nr 5, pp 558 - 563 (USSR)  
ABSTRACT: In continuation of earlier investigations carried out by the  
authors (Ref 1) concerning the influence of weak impurities on  
the structure of the X-ray absorption spectrum, further results  
are reported in the present paper. The experimental system used  
in the present case consisted of a spectrograph with a quartz  
crystal analyzer. The dispersion in the range investigated  
amounted to 5.14 ev/mm and the spectrum was taken with a micro-  
photometer. The K-spectrum of the absorption of potassium in  
the KCl crystal with silver impurities of from 0.001% to 5% was  
investigated. Measuring results are shown in a diagram from which  
it may be seen that the displacement of the principal maximum  
of the absorption spectrum rapidly increases in the beginning  
with increasing impurity of silver,

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On the Influence of Weak Impurities and Roentgenization  
on the X-ray Absorption Spectrum of the KCl Crystal SOV/48-23-5-5/31

and at 5% the displacement attains a value of 0.9 ev.  
Investigations were also made of the influence exerted by  
tellurium admixtures to the CsJ crystal on the  $L_{III}$  absorption  
spectrum, and the same in the case of NaJ. Four diagrams are  
then given showing the measuring results of the potassium ab-  
sorption with different impurities of silver and zinc compounds.  
The increasing displacement of the maxima of absorption with  
larger impurities may be clearly observed from them. Table 1  
summarizes the defect levels occurring in the absorption spectrum  
of the crystals and finally, the results obtained hitherto are  
compared with the known ultraviolet absorption spectrum of the  
KCl crystal with silver impurities. There are 5 figures, 2 tables,  
and 10 references, 6 of which are Soviet.

Card 2/2

POPOV, S.A.; KAMINSKIY, M.Ye.; PERESETSKIY, M.L.; NAYERMAN, M.S.;  
SMIRNOVA, I.S.; MUSAYELYAN, Ye.K.; SIL'VESTROV, V.D. [deceased];  
KULIKOV, A.V.; NESMELOV, A.F., kand.tekhn.nauk, red.; IVANOVA,  
N.A., red.izd-va; GORDEYEVA, L.P., tekhn.red.

[Dressing grinding wheels with diamond and diamond-substitute  
tools] Pravka shlifoval'nykh krugov almaznymi instrumentami i  
zameniteliami almazov. Pod red. A.F.Nesmelo. Moskva, Gos.  
nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 101 p.  
(MIRA 14:1)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut almaznogo  
instrumenta i protsessov almaznoy obrabotki. 2. Gosudarstvennyy  
nauchno-issledovatel'skiy institut almaznogo instrumenta i  
protsessov almaznoy obrabotki (for all except Nesmelo, Ivanova,  
Gordeyeva).

(Grinding wheels) (Diamonds, Industrial)

S/048/60/024/04/01/009  
B006/B017

AUTHORS: Narbult, K. I., Barinskiy, R. L., Smirnova, I. S.  
TITLE: A Nuclear X-Ray Generator for Fluorescence Spectrum Analysis  
PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,  
Vol. 24, No. 4, pp. 354-361

TEXT: The present article is a reproduction of a lecture delivered at the 4th All-Union Conference on X-Ray Spectroscopy (Rostov-na-Donu, June 29 - July 6, 1959). In the introduction some suggestions made in non-Soviet periodicals on possibilities of replacing the X-ray tube by artificially radioactive sources, are discussed. The authors themselves used the gamma- and X-ray emission of  $Tu^{170}$  for fluorescent excitation of the (X-ray) K-radiation of the elements from  $Zn^{30}$  to  $U^{92}$ . In  $Tu^{170}$  radiation ( $Tu^{170}$  decays due to beta-gamma decay) the following occurs: 968-kev and 884-kev beta radiation, 84-kev gamma radiation, X-radiation of ytterbium and thulium ( $Yb-K_{\alpha_{1,2}}$ ,  $Tu-K_{\alpha_{1,2}}$  = 52 kev), and

Card 1/3

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A Nuclear X-Ray Generator for  
Fluorescence Spectrum Analysis

S/048/60/024/04/01/009  
B006/B017

bremsstrahlung (in slowing down the beta particles). The preparation of the Tu source is described. Fig. 1 shows a picture of the partly dismounted container so that also the internal part which houses the source can be seen. Fig. 2 gives a total view. In the following, the determination of the radiant energy is discussed. The instrument used for this purpose, which consisted essentially of a scintillation counter and an amplitude analyzer, is schematically shown in Fig. 3, and its details are described. Next, the author describes the background and possibilities of its reduction. Some details on the excitation of K-series of Ge (excitation energy 11.1 kv), Ag (excitation energy 25.5 kv), Eu (excitation energy 48.6 kv), Os (excitation energy 78.1 kv), and of U (excitation energy 115 kv) are then given. Fig. 5 shows the curves of pulse-amplitude distribution. Fig. 6 shows the Z-dependence of the excitation efficiency of K-emission of the elements from Z=30 to Z=92 by X-ray and gamma emission of Tu<sup>170</sup>. It is shown that this excitation is the most effective in the range from Z=47 to Z=64. Further results on characteristic radiations, studied by means of a scintillation spectrometer (its characteristic dispersion D(E) and resolution  $\Delta E/E$  are shown in Fig. 8), are discussed, and the amplitude distribution curves in recording the

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Card 2/3

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24(7)

SOV/20-130-2-13/69

AUTHORS: Narbutt, K. I., Barinskiy, R. L., Smirnova, I. S.

TITLE: X-Ray Spectroscopic <sup>Fluorescence Analysis With a Nuclear</sup>  
Source of Primary Radiation

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 2,  
pp 291 ~ 294 (USSR)

ABSTRACT: The authors attempted to carry out an X-ray spectroscopic  
fluorescence analysis by replacing the X-ray tube by the  
artificially radioactive isotope  $Tu^{170}$ . The X-ray and  
 $\gamma$ -emission of this source were used for the fluorescence  
excitation of the K-radiation of the elements between  $Zn^{60}$   
and  $U^{92}$ . Because of the low intensity of the excited fluor-  
escence X-ray emission it was not necessary to investigate  
the spectral composition by the crystal-diffraction method  
and to use a scintillation counter with an amplitude  
analyzer. Pressed, hard tabloids were used. The  $Tu^{170}$  source  
(initial activity: 12 c) consisted of pulverulent  $Tu_2O_3$  which  
was pressed into an aluminum-foil vessel, and was intensely ✓

Card 1/4

67519

X-Ray Spectroscopic Fluorescence Analysis With a Nuclear SOV/20-130-2-13/69  
Source of Primary Radiation

irradiated with neutrons. This  $Tu^{170}$  source emits the following radiations: 1)  $\beta$ -radiation with an energy of 968 and 884 kev; 2)  $\gamma$ -radiation with an energy of 84 kev; 3) the characteristic X-ray emission of ytterbium and thulium (primarily  $YbK\alpha_{1,2}$  and  $TuK\alpha_{1,2} \approx 52$  kev); 4) a bremsstrahlung occurring in the slowing down of  $\beta$ -particles in the substance of the source. Figure 1 shows the lines produced by the K-series of several elements under various conditions of excitation. The K-series of Ag (excitation energy of 25.5 kv) is found between the respective values of Ge and Eu. The K-series of Eu (excitation energy of 48.6 kv) is best excited by a 52-kev radiation. The  $\gamma$ -radiation and the bremsstrahlung also participate in its excitation. The K-radiation of Os (excitation energy of 78.1 kv) is excited by an 84-kev radiation and a bremsstrahlung, but not by a 52-kev radiation. The K-series of U is excited only by the bremsstrahlung. Figure 2 illustrates the dependence of the efficiency of excitation of the K-radiation of elements (from  $Z = 30$  to  $Z = 92$ ) by the X-ray emission and the  $\gamma$ -radiation

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X-Ray Spectroscopic Fluorescence Analysis With a Nuclear SOV/20-130-2-13/69  
Source of Primary Radiation

of the  $Tu^{170}$  source upon  $Z$ . This nuclear generator is the most efficient for elements from  $Z = 50$  to  $Z = 63$ . The occurrence of false maxima is pointed out. The dispersion curve of the scintillation spectrometer is a broken line consisting of two straight sections. Despite the low resolution of the scintillation spectrometer used it is possible to solve some analytical problems. This method is employed to analyze the element pairs Ta - Nb and Hf - Zr, for example. The authors tested the above-described nuclear generator first in a qualitative determination of the total amount of rare earths in various minerals. The results obtained were in close agreement with those found by ordinary fluorescence X-ray spectroscopic analysis and the crystal-diffraction method. The method described is further suited for a rapid determination of minerals, and the small size of the apparatus is advantageous for investigations in the open air. There are 4 figures, 1 table, and 11 references, 2 of which are Soviet. *4*

Card 3/4

67,19

X-Ray Spectroscopic Fluorescence Analysis With a Nuclear SOV/20-130-2-13/69  
Source of Primary Radiation

ASSOCIATION: Institut geologii rudnykh mestorozhdeniy, petrografii,  
mineralogii i geokhimii Akademii nauk SSSR (Institute for the  
Geology of Ore Deposits, Petrography, Mineralogy, and Geo-  
chemistry of the Academy of Sciences of the USSR). Institut  
mineralogii i geokhimii redkikh elementov Akademii nauk SSSR  
(Institute for the Mineralogy and Geochemistry of Rare  
Elements of the Academy of Sciences of the USSR)

PRESENTED: July 25, 1959, by N. V. Belov, Academician

SUBMITTED: July 24, 1959

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Card 4/4

S/081/62/000/002/028/107  
E151/B108

AUTHORS Marbutt, K. I., Barinskiy, R. L., Smirnova, I. S.

TITLE Application of nuclear radiation in X-ray spectral analysis

PERIODICALS Referativnyy zhurnal. Khimiya, no. 2, 1962, 137, abstract 2D15 (Sb. "Radioakt. izotopy i yadern. izlucheniya v nar. kh-ve SSSR. v. 4. M., Gostoptekhizdat, 1961, 198-200)

TEXT The construction of an PC9-1 (RSYa-1) X-ray spectrometer with a radioactive source instead of an X-ray tube is described. The characteristic radiation of the analyzed element is excited by a  $Ta^{170}$  source, of about 300  $\mu$ curies activity, and is registered by a scintillation counter with a differential pulse height analyzer at its output. The apparatus can be used for the separate determination of such pairs of elements as Ta and Nb, Hf and Zr, Sr and Ba, for determination of the overall content in rare-earth elements (REE) (Ce and Y groups separately), and also for the determination of the content of any element from As to Au when the sample contains no neighbouring (with regard to atomic number) elements. The sensitivity of determination of the total of Ce-group REE elements.

Carri 17

S/048/63/027/003/007/025  
B117/B234

AUTHORS: Narbutt, K. I., and Smirnova, L. S.

TITLE: X-ray K-absorption spectrum and the conduction band in  
alkaline halogenide crystals

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya,  
v. 27, no. 3, 1963, 340-347

TEXT: As there is at present no agreed interpretation of the nature and  
fine structure of absorption spectra an attempt was made to relate the  
experimentally observed structure of such a spectrum to the energy levels  
of the conduction band. K-absorption spectra of potassium in KCl, KBr  
and KI were examined. To determine the spectral structure as regards the  
conduction band, data for X-ray spectra were compared with published data  
for the optical absorption of crystals with F centers. In view of the  
lower sensitivity of X-ray spectral analysis as compared with the optical  
method it was necessary to use crystals having a large number of holes.  
These were prepared by way of small admixtures or through previous  
powerful X-irradiation, the introduction of the admixtures causing the

Card 1/2

X-ray K-absorption spectrum...

S/048/63/027/003/007/025  
B117/B234

holes to form electron capture centers. On comparing the absorption spectra of irradiated crystals with those of crystals not previously irradiated it was possible, on the basis of the observed oscillations, to separate out those of them which represented the occupation of halogenide holes by electrons emitted from the K shell of the potassium during the absorption of X-rays. The investigation showed that only the first line of selective absorption in the X-ray K-absorption spectrum of alkaline halogenide crystals can have originated in an exiton. All the rest of the structure is produced in consequence of a transition of the K-electron into the conduction band of the crystal. There are 5 figures and 1 table.

ASSOCIATION: IGEM AN SSSR

Card 2/2

... . . . .

Смирнов, Г. А. "Application of High-frequency Current to the Disinfestation of Grain." Joint Scientific Council of All-Union Sci Res Inst for Mechanization of Agriculture (VNIIM) and All-Union Sci Res Inst for Electrification of Agriculture (VIESKA), Moscow, 1-55 (Dissertations For Degree of Candidate of Technical Sciences)

St: Knizhnaya Letopis' No. 26, June 1955, Moscow

SMIRNOVA, I.S.

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Yemel'yanov, Ya. G., Eng.

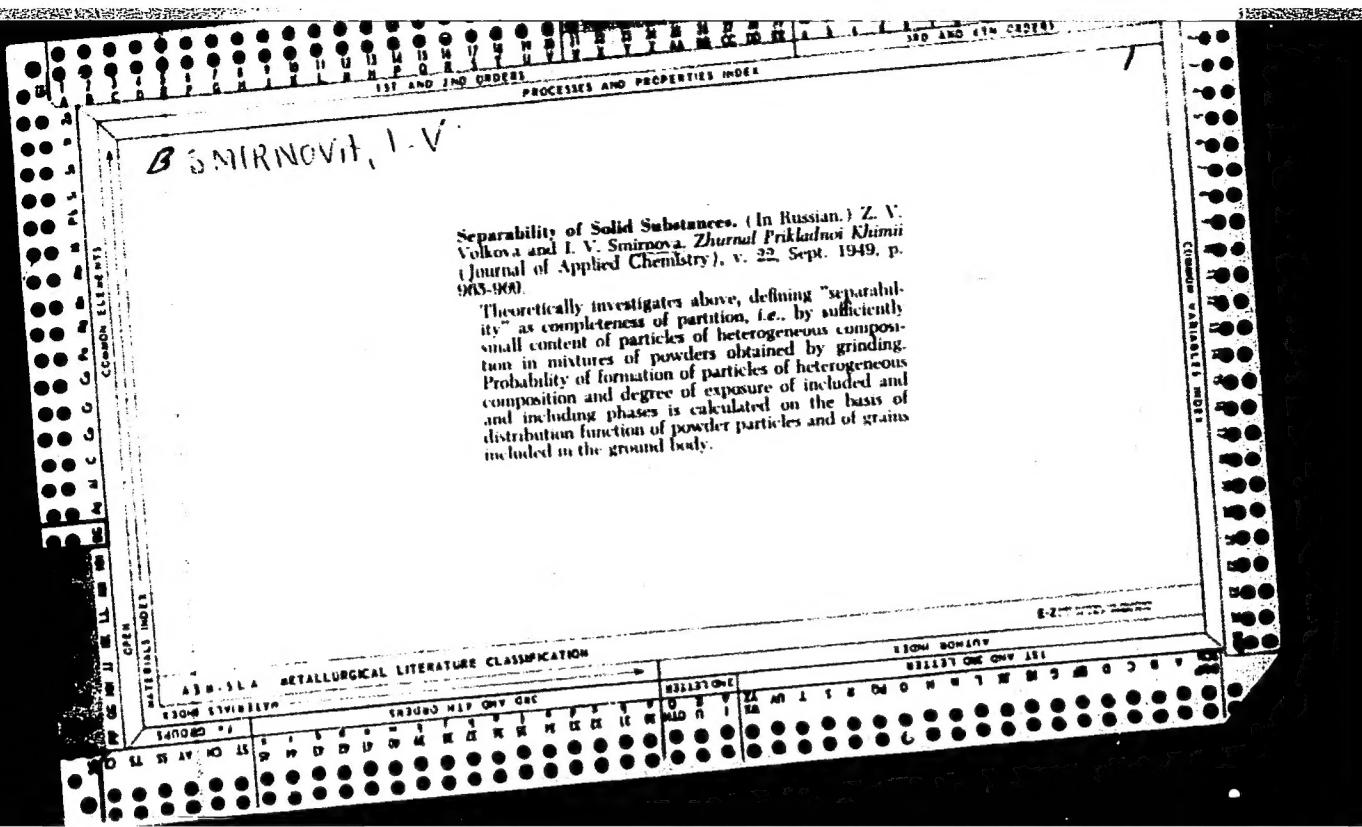
Title : New construction of the electric heater in a centrifugal  
machine

Periodical : Energetik, 7, 22, J1 1954

Abstract : The new electric heater for the NSM-3 type of centrifugal  
machine is briefly described and illustrated by a drawing.

Institution : None

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CA

Peculiarities of the sorption of water by active alumina.  
A. V. Kiselev and I. V. Smirnova. *Zhur. Fiz. Khim.* 23, 1018-24 (1949); cf. *C.A.* 43, 6033i. — Adsorption and desorption isotherms of MeOH and EtOH vapors on  $\text{Al}_2\text{O}_3$  ignited at, e.g., 800° were reproducible; there was hysteresis above the relative vapor pressure  $p/p_0 = 0.5$ , whereas at  $p/p_0$  less than 0.5 both isotherms coincided. Adsorption of  $\text{H}_2\text{O}$  by these  $\text{Al}_2\text{O}_3$  specimens increased after every adsorption-desorption cycle until 1 g. of the sorbent contained 5-7 millimol.  $\text{H}_2\text{O}$ ; then ad- and desorption became reproducible with hysteresis above  $p/p_0 = 0.5$ . The (liquid) vol. of  $\text{H}_2\text{O}$  adsorbed was, at small  $p/p_0$ , 2-3 times that of MeOH or EtOH; this fact shows that  $\text{H}_2\text{O}$  is taken up into the bulk of  $\text{Al}_2\text{O}_3$ , which, therefore, is a "nonrigid" sorbent for  $\text{H}_2\text{O}$  and a "rigid" sorbent for alcohols. A mixt. of  $\text{SiO}_2$  and  $\text{Al}_2\text{O}_3$  behaved like  $\text{Al}_2\text{O}_3$ .  
I. J. Bikerman